

WHAT IS CLAIMED IS:

1. A legged mobile robot comprising:
at least a plurality of movable legs;
actuator devices for driving the movable legs;
a higher-order control system for controlling the
robot;
sensors including at least one of a position sensor, an
acceleration sensor, an angular velocity sensor, which are
and a torque sensor, housed in every joint-actuator device
for detecting driving situations of the actuator device; and
a sensor disposed outside the actuator device for
detecting contact and collision with surroundings,
wherein the actuator device comprises an input
interface for receiving a sensor signal from at least the
one sensor disposed outside the actuator device; a signal
processing unit for removing noise from sensor signals
received from the housed sensors and the outside sensor; and
an arithmetic processing unit for drive-controlling an
actuator motor and for processing sensor-information
according to a command from the higher-order control system.

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2. A robot according to Claim 1, wherein an output
from the contact sensor disposed at an arbitrary position on
the robot is entered to a nearest actuator device in that a

wiring route is the shortest, and in the actuator device, the output of the outside sensor is processed to remove noise and sensor information is computed.

3. A robot according to Claim 1, further comprising a bus provided on the robot for interconnecting the higher-order control system and the actuator devices, wherein via the bus, the actuator device transmits actuator drive-control signals to and from the higher-order control system and also transmits sensor information from the sensors housed in the actuator device and the sensor disposed outside the actuator device.

4. A robot according to Claim 1, further comprising a hub device provided every movable unit for concentrating transmission signal lines.

5. A robot according to Claim 1, wherein the arithmetic processing unit determines that interference is generated when the torque generated in the actuator device disposed in the vicinity of the region with the detected contact information is increased clearly larger above normal while the contact sensor having reference to pinching a foreign substance is turned on within a predetermined period of time.

6. A robot according to Claim 1, wherein the arithmetic processing unit determines that a foreign substance is pinched between a joint and a link when the torque generated in the actuator device disposed in the vicinity of the region with the detected contact information is increased clearly larger above normal while the contact sensor having reference to pinching a foreign substance is not turned on within a predetermined period of time, or when the torque generated in the actuator device disposed in the vicinity of the region with the detected contact information is not increased larger above normal while the contact sensor having reference to pinching a foreign substance is turned on within a predetermined period of time.

7. An actuator device applicable to a joint shaft of a legged mobile robot comprising:

an actuator motor;
a sensor housed in the device for detecting actuator driving situations;
an input interface for receiving sensor signals from at least one outside sensor disposed outside the device;
a signal processing unit for removing noise from sensor signals from the sensor housed in the device and from the outside sensor;

a bus interface for transmitting actuator drive-control signals to and from a higher-order control system and also for transmitting sensor information from the sensor housed in the actuator device and the sensor disposed outside the actuator device via a bus; and

an arithmetic processing unit for drive-controlling the actuator motor and for processing sensor information according to a command from the higher-order control system.

8. A device according to Claim 7, wherein the sensor housed in the device comprises at least one of a position sensor, an acceleration sensor, an angular velocity sensor, a torque sensor, and a temperature sensor.

9. A device according to Claim 7, wherein the outside sensor is one of a contact sensor and a pressure-sensitive sensor for detecting contact and collision with surroundings.

10. A device according to Claim 7, wherein sensor signals are received from the nearest outside sensor via the input interface so as to reduce a wiring route length to the shortest.